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ANALYTICAL APPROXIMATIONS

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Cecil Hastings, Jr.
James P. Wong, Jr.

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Analytical Approximation

Chi-Square Integral: To better than .0002 over

$0 \leq x \leq \infty$ for $m = 3$,

$$F_m(m+x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^{m+x} \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq 1 - \frac{.3916}{\left[1+.09901x+.006958x^2+.0003243x^3\right]^4} \ .$$

Cecil Hastings, Jr.
James P. Wong, Jr.
RAND Corporation

Analytical Approximation

Chi-Square Integral: To better than .00025 over

$0 \leq x \leq \infty$ for $m = 4$,

$$F_m(m+x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^{m+x} \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq 1 - \frac{.4060}{\left[1+.08399x+.006132x^2+.0002676x^3\right]^4} .$$

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RAND Corporation

Analytical Approximation

Chi-Square Integral: To better than .00025 over

$0 \leq x \leq \infty$ for $m = 5$,

$$F_m(m+x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^{m+x} \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq 1 - \frac{.4159}{\left[1+.07406x+.005375x^2+.0002350x^3\right]^4}.$$

Cecil Hastings, Jr.
James P. Wong, Jr.
RAND Corporation

Analytical Approximation

Chi-Square Integral: To better than .0003 over

$0 \leq x \leq \infty$ for $m = 6$,

$$F_m(m+x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^{m+x} \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}} dt$$

$$\doteq 1 - \frac{.4232}{\left[1+.06683x+.004779x^2+.0002064x^3\right]^4} .$$

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RAND Corporation

Analytical Approximation

Chi-Square Integral: To better than .0003 over

$0 \leq x \leq \infty$ for $m = 7$,

$$F_m(m+x) = \frac{1}{2\Gamma\left(\frac{m}{2}\right)} \int_0^{m+x} \left(\frac{t}{2}\right)^{\frac{m}{2}-1} e^{-\frac{t}{2}}\, dt$$

$$\doteq 1 - \frac{.4289}{\left[1+.06133x+.00429x^2+.000187x^3\right]^4}.$$

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